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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,902	03/31/2004	Hemal V. Shah	P19014	9300

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EXAMINER

MISIURA, BRIAN THOMAS

ART UNIT PAPER NUMBER

2112

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/815,902	<b>Applicant(s)</b> SHAH ET AL.	
	<b>Examiner</b> Brian T. Misiura	<b>Art Unit</b> 2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **Detailed Action**

#### ***Specification***

The disclosure is objected to because of the following informalities: The first line of paragraph [25] states "FIG. 2A", however, there is no drawing labeled FIG. 2A, only a FIG. 2. The examiner assumed the applicant meant "FIG. 2", rather than figure "FIG. 2A". Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-7, 9, 11, 12, 14-20, 22, 24, 25, 27-33, 35, 37, 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobayakawa et al, U.S. Patent No. 5,557,744.

Per claims 1 and 27, Kobayakawa discloses: A (method/article of manufacture) for interrupt processing, comprising:

- determining that an event has occurred (column 4, lines 19-24, figure 2 "interruption request")
- determining a state of an event data structure (column 4 lines 24-26, figure 2 and column 4 lines 57-63, "transfer queue unit 5")
- and writing an event entry into the event data structure in response to determining that the event has occurred (column 4 lines 64 – column 5 lines 10, figure 2).

Per claims 2, 15, 28, Kobayakawa discloses:

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- issuing an interrupt in response to determining that the state of the event data structure is armed and that a condition exists to cause an interrupt (column 4 lines 57-63, figure 2).

Per claims 3, 16, 29, Kobayakawa discloses:

- shutting down in response to determining that the state of the event data structure is undefined (column 3 lines 44-50).

Per claims 4, 17, 30, Kobayakawa discloses:

- checking a structure state indicator (column 4 lines 24-26, figure 2 numeral 9) to determine the state of the event data structure (column 4 lines 57-63, figure 2).

Per claims 5, 18, 31, Kobayakawa discloses:

- advancing a write indicator in the event data structure (column 5 lines 6-11, figure 2)
- checking for an overflow condition (column 8 lines 49-55, figure 6)
- and processing the overflow condition in response to determining that an overflow condition exists (column 9, lines 29-33, figure 6 ).

Per claims 6 and 32, Kobayakawa discloses:

- determining that an interrupt has occurred (column 4, lines 19-24, figure 2 “interruption request”)
- reading an event entry in an event data structure in response to determining that the interrupt has occurred (column 4 lines 24-26, figure 2 and column 4 lines 57-63, “transfer queue unit 5”)
- and updating a state of a structure state indicator (column 5 lines 30-35, figure 2).

Per claims 7, 20, 33, Kobayakawa discloses:

- updating the state in the structure state indicator to unarmed in response to determining that the interrupt has occurred (column 5 lines 30-35, figure 2).

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Per claims 9, 22, 35, Kobayakawa discloses:

- determining whether a reset has occurred (column 5 lines 31-36, figure 2, (the data transfer represents resetting the queue))
- and updating the state in the structure state indicator to undefined in response to determining that the reset has occurred (column 5 lines 33-35, figure 2).

Per claims 11, 24, 37, Kobayakawa discloses:

- determining whether an event code for the event entry that was read is clear and processing the event in response to determining that the event code is not clear (column 4, lines 57-63, figure 2).

Per claims 12, 25, 38, Kobayakawa discloses:

- clearing an event code for the event entry (column 5, lines 30-36, figure 2);
- and advancing a read indicator for the event data structure (column 8 lines 10-18, figures 3-6).

Per claim 14, Kobayakawa discloses: A system for in interrupt processing, comprising:

- an Input/Output device coupled to a bus (figure 3 numerals 30 and 20-1-20-n)
- and circuitry at the Input/Output device operable to: determine that an event has occurred (column 4, lines 19-24, figure 2 “interruption request”)
- determine a state of an event data structure (column 4 lines 24-26, figure 2 and column 4 lines 57-63, “transfer queue unit 5”)
- and write an event entry into the event data structure in response to determining that the event has occurred (column 4 lines 64 – column 5 lines 10, figure 2).

Per claim 19, Kobayakawa discloses: A system for in interrupt processing, comprising:

- an Input/Output device driver coupled to a bus (column 4 lines 19-24 figure 2 numeral 8)

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- and circuitry at the Input/Output device driver operable to: determine that an interrupt has occurred (column 4, lines 19-24, figure 2 "interruption request")
- read an event entry in an event data structure in response to determining that the interrupt has occurred (column 4 lines 24-26, figure 2 and column 4 lines 57-63, "transfer queue unit 5")
- and update a state of a structure state indicator (column 5 lines 30-35, figure 2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 8, 21, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayakawa et al. U.S. Patent No. 5,557,744.

Per claims 8, 21, 34, Kobayakawa discloses:

- determining whether to allow interrupts (column 4 lines 47-56, figure 2);

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- and waiting for an interrupt (8 is always waiting for an interrupt).

Kobayakawa does not disclose: updating the state in a structure state indicator to armed in response to determining that interrupts are to be allowed.

- It would have been obvious to one having ordinary skill in the art at the time of the applicant's claimed invention to update the state in an indicator to "full (armed)" in response to determining that interrupts were being allowed because that would allow for the overflow handling to be operated.

3. Claims 10, 23, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayakawa et al. U.S. Patent No. 5,557,744 in view of Yamaoka et al. U.S. Patent No. 5,214,759.

Per claims 10, 23, 36, Kobayakawa discloses:

- updating the state of the structure state indicator to unarmed (column 5 lines 30-35, figure 2).

Kobayakawa does not disclose: initializing the event data structure and notifying an I/O device of the location of the event data structure.

However, Yamaoka discloses: initializing the event data structure and notifying an I/O device of the location of the event data structure (Yamaoka, column 5 lines 2-10, figures 1 and 2).

- It would have been obvious to one having ordinary skill in the art at the time of the applicant's claimed invention to incorporate the teaching of Yamaoka into the system of Kobayakawa in order to have a consistent mapping of which event data structures belong to which I/O devices.

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- The modification would have been obvious because one having ordinary skill in the art would want to have a consistent mapping of which event data structures belong to which I/O devices (Yamaoka, column 5 lines 2-10, figures 1 and 2).

4. Claims 13, 26, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayakawa et al. U.S. Patent No. 5,557,744 in view of Schmidt U.S. Patent No. 6,792,483.

Per claims 13, 26, 39, Kobayakawa does not disclose limitations of the claimed invention.

However, Schmidt discloses:

- generating multiple event data structures for one I/O device (Schmidt, column 5 lines 12-23, figures 1-2)
- wherein events for different I/O device functions are associated with one of the multiple event data structures (Schmidt, column 5 lines 16-23, figures 1-3, (the different functions are sending and receiving))
- and dynamically mapping each of the multiple event data structures to a processor (Schmidt, column 5 lines 2-32 figures 1-3).

- It would have been obvious to one having ordinary skill in the art at the time of the applicant's claimed invention to incorporate the teaching of Schmidt into the system of Kobayakawa in order to have dedicated queues for each processor, where each queue represents a different function for each I/O device.

- The modification would have been obvious because one having ordinary skill in the art would want to have dedicated queues for each processor, where each queue represents a different function for that I/O device (Schmidt, column 5 lines 12-32, figures 1-3).



**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Misiura whose telephone number is (571) 272-0889. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen can be reached on (571)272-3676. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Brian Misiura*  
12-10-05

*[Signature]*  
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SUPERVISORY PATENT EXAMINER  
12/12/05